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COLLEGE BULLETIN

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THE HOME PRESERVATION OF FRUITS AND VEGETABLES

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EXTENSION BULLETINS

(May be obtained by addressing IRENE M. DAVIDSON,
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THE HOME PRESERVATION OF FRUITS AND VEGETABLES

FOREWORD

"The Home Preservation of Fruits and Vegetables," Bulletin No. 66, by Lillian Peek, is a complete revision of part two, Bulletin 55, "The Home Preservation of Fruits and Vegetables" by Peek and Washington of the Department of Extension, College of Industrial Arts. The revision was considered desirable because of more exhaustive experimentation in preserving and canning, especially the latter, in this section of the South, the experimentation resulting in a more workable knowledge of the causes of poor success and failure in the various methods of canning and preservation in Texas. The policy of the Department of Extension of the College of Industrial Arts — of making suggestions and directions as practical and easily understood as possible — has been followed in the working up of Bulletin 66, and technical or school terms and usages have been eliminated as far as possible.

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THE HOME PRESERVATION OF FRUITS AND VEGETABLES

PRINCIPLES INVOLVED IN CANNING

The fundamental principle in preserving a food product is the administration of heat in due degree and for sufficient time to effect sterilization, then the maintenance of this sterile condition in hermetically sealed containers. An object is said to be sterile when it has been freed from all living organisms.

There are three types of organisms which effect spoilage in foods; these organisms are known as yeasts, molds and bacteria. Yeasts thrive on sugary foods; molds thrive on sugary and acid foods such as tomatoes and fruits; bacteria thrive on protein (nitrogenous) foods, milk, meat, eggs, fish and vegetables, not acid in nature.

The yeasts are so easily killed that we do not of necessity give them especial attention. Molds are easily killed by the boiling temperature of water and only a few minutes time. Bacteria are killed by the boiling temperature of water if this temperature is kept up for sufficient time, but the dormant bacteria (spores) are not killed by the boiling temperature of water. It is therefore necessary to raise the temperature of foods susceptible to spore-bearing bacteria to a temperature higher than 212 degrees Fahrenheit, (the boiling temperature of water); or cook them a prolonged period of time; or cook them intermittently, as explained below.

METHODS OF CANNING

Steam Pressure Method (temperature above 212 degrees Fahrenheit. Temperature above the boiling point of water is accomplished by the use of a *steam pressure canner* — a temperature of 240 degrees Fahrenheit (ten pounds pressure) being the temperature generally used. The time of processing or cooking to sterilize the food by this method differs according to the product being canned.

Another less rapid method is the intermittent process. This is based on the fact that spores develop into bacteria

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within a few hours after cooling the vegetables. Pint jars are cooked for one hour the first day — allowing the jars to cool and spores to develop into bacteria; they are cooked for one hour the second day to destroy the bacteria thus developed. The third day's cooking being used as a safeguard against any spores which might have been present on the second day and not reached by the boiling temperature of water.

If canning is done in very warm weather it is best not to wait the full 24 hours between periods of cooking but to wait only about 12 hours instead (some cook three times allowing a lapse of only eight hours between periods).

*A method which is successful in some seasons (due to the low resistance of the forms of bacteria present that season) is the prolonged or one-period method of cooking—*this means cooking the vegetable from three to six hours continuously. This method is not to be recommended as highly as the methods give above. The best jars and rubbers are necessary to the keeping of vegetables after sterilization has been effected. If air laden with organisms is allowed to enter the jar the food becomes contaminated and will surely spoil. If the tops for jars are made of such substance as is affected by the heat or acid of foods they should not be used. Spring top jars are recommended most highly from a sanitary and economical standpoint; although the initial cost is greater, the return is greater.

GOOD RUBBERS NECESSARY

Without good rubbers successful canning in glass cannot be accomplished. Good rubbers will stretch and return promptly to place without changing the inside diameter. They should be reasonably firm and able to stand bending and even folding and pinching together without breaking or cracking. Good rubbers should withstand the heat necessary for preserving fruit and vegetables either in boiling water or in steam under pressure. Test your rubbers carefully.

SUGGESTIONS

The first essential for successful canning regardless of process used is absolute cleanliness in surroundings and in all utensils used in canning. Tables should be well cleaned and well rubbed over with a moist clean paper or cloth as

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often as the table becomes dry or the least bit dusty. A table covered with white oil-cloth is very acceptable. Proper means for disposal of waste must be provided, as decaying waste not only draws flies but becomes the home of teeming millions of bacteria which send out spores and contaminate the fruits and vegetables under preparation and render the process of sterilization more difficult.

STEPS USED IN CANNING

- 1 — Select fresh products.
- 2 — Grade or sort according to size.
- 3 — Prepare for canning (wash, trim, etc.)
- 4 — Blanch (scald) and cold dip (plunge in cold water).
- 5 — Pack carefully in jars or tins.
- 6 — Fill with boiling liquid (water or juice.)
(If vegetables add 1 teaspoon of salt to 1 quart of liquid.)
- 7 — Adjust new rubber if glass (solder on top if tin.)
- 8 — Clamp down cover.
- 9 — Sterilize in boiling water or steam pressure canner.
- 10 — Remove from sterilizer.
- 11 — Tighten covers.
- 12 — Set aside to cool.
- 13 — Test jars for leakage by tilting jars.
- 14 — Store when cold in a cool dark place.

RECIPES FOR CANNING VEGETABLES

GENERAL STATEMENT

The time given in the following recipes is for pint jars and in using larger jars the time of cooking should be increased in proportion to the size of the jar. Remember that rapid cooling of jars contributes greatly to the keeping of the product (avoid drafts at first). If jars could be placed in refrigerator over night the keeping of the product can better be insured. The jars should be stored in a cool dark place. Jars should be labeled immediately after the last cooling.

CANNED STRING BEANS

To prepare beans for canning, wash freshly picked beans thoroughly, remove strings and break in desired lengths. Avoid using old beans or any with blemishes as this frequently causes cans to spoil. Tie the beans in a cheese cloth bag and blanch from five to eight minutes in boiling water. Remove and plunge in cold water. Pack in glass jars up to the neck; fill to overflowing with hot water and add one-half teaspoon of salt to one pint jar. Place rubbers and tops on jars but do not clamp top down.

Place jars on a false bottom in a kettle, wash boiler, or container in which cans are to be cooked. Fill boiler with hot water until it reaches two inches over the jars.

To cook by intermittent method — bring the water to the boiling point and cook one hour. Remove jars, with tongs and clamp tops on. The second day the tops are loosened and the process of cooking the beans is similar to the first day. The third day the clamp is loosened, and the beans allowed to cook for an hour after the boiling begins, after which time remove the jars, and clamp the tops on tight. Examine tops to see that the jars do not leak; cool the jars as quickly as convenient, label and place in a dark, cool place.

To cook beans by prolonged or one-period method—prepare jars as above. Cook three to four hours under water, clamp tops on tight. Remove and examine for leakage.

Steam pressure method—Fill jars as for other methods, place lids on loosely and cook at ten pounds pressure for from thirty to forty minutes. If the spring is brought almost down and a small splinter or match stem is used under it as the only means of preventing its sealing, less water will be lost in the cooking and the product is more attractive. Slow cooling of the canner also prevents the escape of the water. Let pressure fall to zero before opening canner.

NOTE — If larger jars are used increase time of cooking in proportion to size of jars.

OKRA

Use fresh, young and tender pods of okra, canning them the same day they are picked.

To prepare okra, cut off hard stems. Scrub outside with brush. Blanch six to eight minutes. Follow the above methods and time used for canning beans, the intermittent

and steam pressure being preferable. (Okra is very satisfactory dried.)

ASPARAGUS

It is of the greatest importance that asparagus for canning be fresh and tender. Select tips of uniform size and wash them. Cut in right length for cans, scrape off tough outer skin, and tie in bundles. Blanch by immersing the lower ends part way in boiling water for two minutes. Then immerse the entire tips for one to two minutes longer. Plunge into cold water, then pack neatly, tips up. Fill jars with brine (four tablespoons salt to one gallon water) and cook intermittently (one hour on each of three successive days) exactly as beans or in a steam-pressure canner thirty to forty minutes under ten pounds steam, (a temperature of 240° F.)

PEAS

Peas are more difficult to can than most other vegetables, and great care should be taken to have them very fresh and young. They are best gathered in the early morning or when cool. Work should be done rapidly, and peas should not stand after being shelled. Shell and sort, putting peas of the same size and degree of maturity together. Be sure not to use hard ripe peas among tender ones.

Blanching is very important. If well done it prevents cloudy liquor, makes the peas tender, and also removes some of the gluey substance which coats them. Blanch one to four minutes, depending upon the maturity of the peas. Put again into cold salt water (one tablespoon salt to one quart water) for an instant after blanching.

Drain and pack to within one-half inch of the top of the jar. If too full some of the peas will burst and make the liquor cloudy. Add one teaspoon sugar and one-half teaspoon salt to each pint, fill with boiling water, and work out bubbles.

If peas are very small and tender, cook pints at boiling temperature for three hours one-period. If medium-sized peas are packed, process (cook) intermittently as beans or forty minutes under ten pounds steam pressure.

PEPPERS

The best sweet peppers for canning are the Spanish varieties known as pimientos. The fruit of these peppers

has very thick flesh, tough skin, and is comparatively smooth and free from ridges. The bell peppers are not suitable varieties for canning. Peppers should be ripe, sound, and free from bruises. Sort, using the whole peppers for canning. Prepare for peeling by placing peppers in a hot oven for six to eight minutes, being careful not to allow them to become hot enough to discolor. Peel, cut out stem, remove seeds, and pack dry in flattened layers. No water or seasoning is used in the preparation of these peppers; the cooking brings out a thick liquor which almost covers them in the can. Adjust rubbers and tops. Boil pints for thirty minutes.

CANNED BEETS

Wash and cut off all except three inches of tops, and the root of young tender beets. Cook in boiling water until almost tender, plunge in cold water, remove skin, stems and roots; pack in jars and cover with water to overflow jar; add one-half teaspoon of salt to a pint jar and one teaspoon of sugar. Subject pint jars to ten pounds pressure for thirty minutes or use intermittent process one hour each day on three successive days, or one-period method four hours at your own risk.

CARROTS

Proceed the same as for beets.

CANNED CORN

Corn should be canned while fresh, because it sours very quickly, due to bacteria and sugar present. The amount of sugar in the sweet varieties diminishes very rapidly after the ear is pulled from the stalk. In order to retain the original sweetness and flavor it is necessary to can corn very soon after it is pulled, within an hour if possible. Select the ears with full grains before they have begun to harden, as this is the period of greatest sugar content. Husk them and brush the silks off with a stiff brush. Cut off the grains with a sharp knife and pack the jar to neck only. Corn swells when cooked. Add salt to taste, (usually about a teaspoonful to a quart is sufficient) and fill up the jar to the top with cold water. Put the rubber ring around the neck of the jar and place the glass top on, but do not clamp down. It is necessary to have the water well over the top of the jars. Put the cover on the boiler and set it on the stove, bring the

water to a boil and keep it boiling for one hour. Press down the spring at the side of the jar. This prevents outside air from getting in. After twelve hours raise the spring at the side of jar. Place jars in boiler and boil one hour. Clamp on top as preceding day and allow to cool. Repeat this operation after another twelve hours. In removing the jars from boiler be careful not to expose them to a draft of cold air while they are hot. Cool as quickly as possible without endangering the jars. Keep in dark dry place. Place a new rubber on the jar before cooking the last time if the old one is injured. Steam pressure may be used ten pounds for fifty minutes, or one-period method four to six hours.

CONCENTRATED VEGETABLE SOUP

Any desired mixture of vegetables may be packed for home use. A good combination consists of one quart concentrated tomato pulp, one pint corn or tiny lima beans, one pint okra, four teaspoons salt and sugar seasoning, one small onion chopped, and one-half cup of chopped sweet red pepper. Cook the tomatoes, pepper, and onion, put through a sieve to remove seeds, and cook down to about the consistency of ketchup. Measure, add the corn or beans and okra, which have been prepared as for canning, add seasoning, and cook all together for ten minutes. Pack and boil quarts for two hours continuously at boiling, or for thirty minutes under ten pounds steam pressure.

— *Farmers' Bulletin No. 853.*

SOUP MIXTURE

One pint of tomatoes, one cup of blanched corn or lima beans, one cup of okra cut in slices, one slice of onion two inches in diameter, one-half teaspoon of salt and one-half teaspoon of sugar. Cook mixture until okra and corn are almost done, about ten minutes, pack in jars, fill with brine of one tablespoon of salt to one quart water, Cook three hours continuously, or fifty minutes in the steam pressure cooker at ten pounds pressure. Clamp tops on.

PUMPKINS

Select pumpkins of even ripeness, wash, cut into slices and steam until tender. Remove the pulp from the shell and heat it thoroughly in a pan over boiling water (double boil-

er). The following proportion of ground spices may be added to the pumpkin if desired when canning: To each quart of steamed strained pumpkin add one-half cupful of brown sugar, two teaspoons of cinnamon, one teaspoon of salt, and one teaspoon of ginger. Stir the pulp until it is of a smooth, even consistency, pack into cans or jars while hot, and cook after actual boiling begins one hour for three successive periods twelve hours apart. If in cool weather twenty-four hours apart, or subject to ten pounds steam pressure for sixty-five minutes.

SQUASH

Squash is canned by the same method as pumpkin omitting the spices.

SPINACH

Prepare spinach by picking off all the dead leaves and cutting off the roots. Wash spinach thoroughly several times using a large tub of water so that dirt and grit will sink to the bottom. Drain free from all water. Steam spinach over a pan so as to catch juice for filling jars if any liquid is needed. The spinach may be packed cut or uncut. Standard brands demand that the spinach shall be left uncut. Add one teaspoon of salt to a pint jar. Cook from one to two hours (two inches under water) after boiling begins, or subject to ten pounds steam pressure thirty-five minutes.

CANNED TOMATOES

Select ripe, red, uniform tomatoes and can the same day that the vegetable is picked. Scald tomatoes from one to one and one-half minutes. Plunge in cold water, cut out the core, remove the skin, and remove all green spots or blemishes. Pack the tomatoes in glass jars, fill to overflowing with tomato juice (cook and press juice from small irregular tomatoes for this purpose). Place the rubbers and lid on, do not clamp down cover. Place the glass jars in a basket or rack in a kettle with a false bottom and cover the jars with water two inches over the top. Boil twenty minutes after actual boiling begins. Clamp the lids on or screw top tight, remove jars and examine for leaks, label and store.

CANNED FRUITS

CANNED DEWBERRIES

Remove all soft berries, wash and pick carefully and pack at once in jars. Put rubbers on jars before cooking. Place jars on false bottom in kettle and cook for from fifteen to twenty minutes after actual boiling begins and before adding syrup. Remove jars and fill to top with syrup made with one part sugar to four parts of water or berry juice. Seal immediately.

CANNED STRAWBERRIES

Strawberries may be canned by the same method.

CANNED PEACHES

Take firm, ripe peaches, place in a wire basket or cheese cloth and blanch for thirty *seconds* in boiling water, plunge in cold water. Peel, stone, and pack in jars and cover with a syrup made by boiling together one cup of sugar and one cup of corn syrup to one and one-half pints of water. Cook fifteen minutes at five pounds pressure or cook thirty minutes under hot water as described in the vegetable recipes. Clamp lids on. (A weaker syrup may be used if desired.)

PEARS

Select ripe pears which are not too soft. Peel, and blanch by immersing in boiling water for a few seconds (15 to twenty seconds) plunge in cold water, drain and pack rapidly. Blanching renders the harder varieties more pliable and they pack better and makes them more transparent in appearance. Small pears may be canned whole. In packing whole leave the stems on and leave them up in the jar, letting the second row fill the spaces between the stems, and so on until the jar is full. When the jars are full fill with syrup used in canning peaches.

NOTE — A small piece of ginger root or a few slices of lemon rind may be cooked in the syrup for pears if desired.

PLUMS

Select smooth, ripe plums, but not too soft. Do not remove skin but prick each plum in several places that the

skin may not burst. Add syrup used for peaches. Cook in jars under water fifteen to twenty minutes after boiling begins. Remove, seal and test for leaks.

FRUIT JUICES

The juices of such fruits as grapes, currants, blackberries, strawberries, raspberries, elderberries, and cherries make a delicious and wholesome drink, and could be much more widely used in the home. The flavor of these juices is finer when they are sterilized below the boiling point. Select sound ripe fruit, crush, and heat slowly to about 180° Fahrenheit (simmering point.) Strain through double thickness of cheese cloth, and if juices free from sediment are wanted, let stand in a cool place for a few hours. Then pour off carefully to free from the dregs, which will remain in bottom of vessel. The addition of sugar will make flavor finer. It may be used in any desired proportion, a fair allowance being one cup of sugar to one gallon of juice. It is more economical to sweeten some fruit juice with the natural syrup obtained from the same fruit — for example, apple and grape. Pour the juice into sterilized bottles (boiled twenty minutes), put sterilized stoppers in lightly, set bottles on rack in water bath, and cook at simmering point for thirty minutes. Remove from water bath, put stoppers in tightly, and when cool dip top of bottle into melted paraffin or sealing wax. A good wax may be made by melting together equal parts of rosin and beeswax.

These homemade fruit juices will be excellent for use in gelatin desserts, puddings, sauces, ice cream, sherbet, etc. They can be bottled without any sugar and later made into jelly. This method for grape jelly insures the getting rid of crystals, which are objectionable in jelly.

UNFERMENTED GRAPE JUICE

Pick three quarts of grapes from the stems and wash thoroughly; place in a porcelain kettle, add cold water. Boil slowly for five minutes and turn grapes into heavy bag. Drain and when cool press out all of remaining juice. Add desired amount of sugar, heat to boiling point, skim and store in fruit jars or bottles. Seal the bottles with corks and cover with paraffin or sealing wax.

JELLY MAKING SUGGESTIONS

Some fruits are better suited for jelly making than others. The best fruits for making jelly contain both pectin and acid. Pectin is absolutely essential and does not exist in some fruits, to any great extent, such as peaches, cherries and strawberries; yet these fruits contain sufficient acid. On the other hand some fruits contain pectin in abundance but the acid must be supplied from some outside source. Examples of these fruits are pears, quinces and the peel of oranges. With the addition of the lacking substance a jelly can be made with the color and flavor of any fruit desired.

TO EXTRACT JUICE

Wash such fruit as berries, grapes, and currants in running water and add one cup of water for each pound of fruit. For apples, quinces, peaches, and such hard fruits, wash, slice, and add three cups water to each pound of fruit. The fruit should be cooked until tender, a small quantity of water being added to help extract the juice. The fruit juice will flow more freely when heated than when cold, and the cooking develops the pectin. As soon as the fruit is tender the liquid should be squeezed through a cheese cloth and then allowed to drip through a flannel or heavy muslin bag to remove all sediment. It is difficult to produce a clear jelly from the juice of over-cooked fruit. The juice should now be cooled to room temperature at which time it is ready for use. The proportion of sugar to juice varies slightly according to the amount of pectin present, from one-half to one cup of sugar to one cup of juice. The general proportion of three-fourths cup of sugar to one cup of juice is quite reliable. For such fruits as apples, crabapple, currants and grapes one cup sugar to one cup of juice may be used.

MAKING JELLY

The quantity of juice to be cooked at one time will depend upon the size of the vessel and the methods of heating available. The capacity of the vessel used should be four times as great as the volume of juice to be cooked. If the attempt is made to cook a large quantity of juice at one time

over a slow flame, there will be a loss of color and a decrease in the yield, partly due to the destruction of the pectin.

When the proportion of sugar* to juice has been determined, measure the fruit juice and place over the fire to cook. When the juice begins to boil, add the sugar immediately and stir until the sugar is dissolved. By adding the sugar when the juice begins to boil, more time is given for the inversion of the sugar by the acids of the fruit and there is less danger of crystallization.

After the sugar has dissolved, the cooking should be as rapid as possible. Finished jelly can be obtained more quickly by rapid cooking. Long cooking will tend to darken the product and destroy the pectin, which will cause the finished jelly to be less firm.

Since no definite temperature can be given for the finished jelly, the most convenient means of determining when it is finished is to test it with a spoon or paddle. Dip a spoon or wooden paddle in the boiling mass. Remove and cool by moving it back and forth for a few seconds and then allow the jelly to drop from it. As long as there is sirup present it will run or drop from the spoon. When the jellying point is reached, it will break from the spoon in flakes or sheets. When this jelly stage is reached, remove from the fire immediately and skim. Skimming at this point saves waste.

After skimming the jelly, pour at once into hot sterilized glasses and set aside to cool.

Cool as rapidly as possible, avoiding dust which will give contamination with mold. When the jelly is cold cover it with melted paraffin. By running a pointed stick or skewer around the edge of the glass while the paraffin is still hot, a better seal can be obtained.

Jelly should be stored in a cool, dark, dry place. If jelly is stored for a long period of time, it will deteriorate in texture.—*Farmers' Bulletin No. 853.*

*Substitute one-fourth corn syrup for sugar in jelly-making and one-half in preserving and canning.

PREPARATION OF ORANGE PECTIN

Cut the yellow portion of the peel of five oranges, being sure to remove all oil cells, but as little of the white portion as possible. Then cut off the white portion of the peel from the pulp as if peeling apples. For each pound of the

peel add one quart of water. Add the juice from lemons, mix thoroughly and allow to stand twenty minutes. At the end of this time add one pint of water, boil for ten minutes and allow to stand over night. Next morning boil for ten minutes, allow to cool, place in a flannel bag or heavy muslin bag, press to remove the juice, then drain juice through a clean flannel or muslin jelly bag to clarify. This may be placed while hot in sterilized jars, sealed, and kept for later use, or used immediately.

MINT JELLY EXTRACT

Remove leaves and tender tips from two bunches of mint. Pound with a wooden mallet or in a mortar, adding gradually one-third cup sugar and one-third cup water. When thoroughly macerated steep for six hours. Strain and bottle or use in making

MINT JELLY I

1 pint concentrated orange
pectin juice,

Juice of 1 lemon,
2 cups sugar.

Bring the pectin juice to boiling, add sugar and boil rapidly until the jelling point is reached. Add two teaspoons of mint extract to each cup of jelly. Strain into glasses.

MINT JELLY II

3 cups apples,

1½ cups water.

Cook in the usual way for apple jelly. Strain off juice. Measure and add three-fourths as much sugar as there is juice. Boil until nearly done and add two teaspoons mint extract to each cup of juice, or add two drops of oil of peppermint and a little green coloring (one to two drops.)

STRAWBERRY AND ORANGE PECTIN JELLY

½ pint concentrated orange
(or apple) pectin,

½ pound sugar,
½ pint strawberry juice.

Mix orange pectin juice and the strawberry juice, bring to a boil, and add sugar. Continue boiling until the jelling point is reached. Pour immediately into hot sterilized jelly glasses and skim. When cold, pour hot paraffin over the jelly.

PINEAPPLE AND ORANGE PECTIN JELLY

Add one pint orange pectin juice to one pint pineapple

juice which has been boiled for ten minutes, add one pound sugar, and continue boiling until the jelling point is reached. Pour immediately into hot sterilized jelly glasses and skim. When cold, cover with melted paraffin.

APPLE JELLY

1 pound apples,

1 quart water.

Boil apples and water together for three-fourths of an hour. There should be about one pint of strained juice. Bring this juice to the boiling point and add an equal measure of sugar or a little less. Cook as rapidly as possible until the jelling point is reached. Remove from the fire, skim, pour into hot sterilized glasses and when cold cover with melted paraffin.

BLACKBERRY JELLY

2 quarts blackberries,

2 cups water.

If one-fourth of the berries are picked underripe a better jelly can be made. Wash the berries by running water over them through a sieve. Remove caps, crush and add the water and boil fifteen minutes. Press the pulp and strain the juice through a flannel or heavy muslin bag. Measure three-fourths cup sugar to one cup of juice. Bring juice to boiling point and add sugar. Stir until the sugar is dissolved. Continue boiling until the jelling point is reached. Remove from the fire and skim. Pour into hot sterilized glasses; when cold, seal, label and store.

GRAPE JELLY

Remove the grapes from the stems, put over a slow fire in an agate or white-lined saucepan, and let simmer very gently until the fruit is softened throughout; then pour into a bag and drain off all juice possible. Take one cup of sugar for each cup of juice; heat the sugar in the oven; meanwhile, heat the juice to the boiling point and let boil rapidly about five minutes, skimming as needed, add the sugar and let boil until a little will form jelly on a cold saucer or from the tip of the spoon. Have ready jelly glasses which have been filled with hot water. When the jelly is done, pour the water from the glasses, fill with jelly and remove to a cool place. When cold, cover with paraffin and cover and store.

PLUM JELLY

Take the plums before they are wholly ripe, cover with boiling water and let them boil slowly until they are thoroughly cooked. Then drain through a jelly bag. Use an equal measure of sugar and plum juice and finish like other jellies.

MARMALADES, JAMS, PRESERVES AND PICKLES*

PEACH MARMALADE

Cook the following ingredients together until thick and clear:

2¼ pounds of peaches cut in small pieces,	1 stick ginger,
1 pound of sugar,	1 teaspoon of cinnamon bark,
6 whole allspice,	1 teaspoon mace,
1 cracked peach seed,	½ cup of peach juice.

Tie the spice in cheese cloth bag. When done pack marmalade while hot in sterilized jars and seal at once.

SWEET PICKLED PEACHES

One-half peck peaches, two pounds brown sugar, one pint vinegar, one ounce stick cinnamon, cloves. Boil sugar, vinegar and cinnamon twenty minutes; dip peaches in hot water, pare and stick each peach with four cloves. Put into syrup and cook until soft. Cook about two quarts of peaches at a time. Place peaches in a jar or crock when cooked and cover with thick syrup. If vinegar used in this recipe is very acid dilute quantity given.

PLUM PRESERVES

Prick the plums with a coarse needle. Allow a pound of sugar to each pound of fruit, and a cup of water to each pound of sugar. Let boil and skim; then add plums, a few at a time, and let boil gently about twenty minutes. Re-

*From one-fourth to one-half the measure of sugar may be displaced by the same measure of corn syrups in marmalades, jams, preserves, and pickles. Use the minimum substitution in the marmalades.

move the fruit to jars with a skimmer and let the syrup boil until it gives the test for jelly. Fill jars three-fourths full with plums, fill jars with syrup and seal.

PLUM MARMALADE

The plums which are used in the making of jelly may be removed from the bag before the juice is entirely drained. Put plum pulp through a wire strainer, sweeten to taste and simmer until the sugar is thoroughly dissolved. Ordinarily three-fourths pound of sugar is used to one pound of fruit.

PEAR CHIPS

Wipe eight pounds of pears, remove stems, quarter and core; then cut in small pieces. Add four pounds of sugar and one-fourth pound of ginger, and let stand over night. In the morning add four lemons cut in small pieces, rejecting seeds, and cook slowly for three hours. Put in stone or glass jars and seal.

GINGERED PEARS

Use pears not quite ripe, peel, core, and cut into thin slices. To eight pounds of pears, allow six pounds sugar, one cup of water, and the juice of four lemons. Cut the lemon rinds into thin strips and add them. Also add one-eighth pound of ginger root cut into pieces. Simmer until thick as marmalade. Pack like peach jam.

SWEET PICKLED PEARS

Boil two pounds of brown sugar, one pint of vinegar, and one ounce of stick cinnamon, about twenty minutes. Stick pears with four cloves and put into the syrup and cook until soft and transparent. Put in stone jars and seal.

GRAPE JAM

Wash the grapes, pick from the stems, press with the thumb and forefinger on the grapes, one by one, to separate the pulp from the skin. Heat the pulp over the fire until it softens and changes color a little, then, with a pestle rub the pulp through a puree strainer, leaving the seeds in the strainer. To the pulp, add the skins and sugar to equal the

weight of the skins and pulp. Mix thoroughly and let cook about fifteen minutes. Store in glass jars.

TOMATO MARMALADE

4 quarts ripe tomatoes,	1 cup seeded raisins,
3 cups corn syrup,	6 lemons.
5 cups sugar,	

Put sliced tomatoes, seeded raisins, syrup and sugar in preserving kettle and let stand over night. Cut lemons in very thin slices and simmer in clear water until very tender. Add to other ingredients and boil until thick. Pack in hot sterilized jars and seal, label and store.

SWEET ORANGE OR GRAPEFRUIT MARMALADE

Wash the fruit, weigh the peel and discard one-fourth of it, and note the weight of edible portion plus remaining peel. Place peel in water, boil for five minutes, and pour off water. Again cover peel with boiling water and allow to simmer over the fire until tender. Pour off water and add cold water to harden the peel. Then cut into as thin slices as possible. Place edible part of the orange or grapefruit in a kettle with twice the amount of water as of fruit and boil until the pulp has disintegrated. Strain through a muslin or cheesecloth bag, and for each pound of the edible portion and shredded peel add one and one-half pounds sugar. Boil until the jellifying point is reached.

— *Farmers' Bulletin No. 853.*

SOUR ORANGE MARMALADE

1 pound peeled sour oranges,	1 pound sugar.
2 pounds water,	

Preparation of the peel: Wash fruit, remove peel; discard one-fourth of the peel, using the portion free from blemish. Cut this peel into as thin slices as possible, place in a kettle with four times its weight of water, boil for ten minutes, and drain free from water. Repeat this process three times.

Preparation of the juice: After the peel has been removed, weigh the fruit, cut into small pieces, place in a kettle, and for each pound of orange add two pounds water. Boil until it thoroughly disintegrates. Pour into a flannel jelly bag and press until no more juice can be obtained.

Again drain juice through a clean flannel jelly bag without pressing.

Pour this juice into a kettle, add the peel, bring to a boil, add one and one-half pounds sugar for each pound of fruit, and continue the boiling until the jelly stage is reached, which is indicated by the flaking or sheeting from the spoon.

— *Farmers' Bulletin No. 853.*

ORANGE MARMALADE, LONG PROCESS

1 dozen oranges,
8 quarts water,

$\frac{1}{2}$ dozen lemons.

Slice fruit with a sharp knife; cover with water and let stand twenty-four hours. Boil fifteen minutes, and let stand another twenty-four hours. To every pint of the mixture, add one pint sugar, boil from twenty to thirty minutes, and put in jars.

CUMQUAT ORANGE PRESERVE

Cut oranges without peeling into halves or quarters, and take out seeds.

Weigh oranges:

To 1 pound orange take

$\frac{3}{4}$ pound sugar and

$\frac{1}{2}$ pound water.

Let fruit simmer in water until tender, but not broken. Skim out. To liquid which has evaporated, add enough to make up for evaporation: add sugar and juice of one lemon for each pound fruit. When sugar is melted let boil six minutes, skim, add cumquats and simmer until transparent. If syrup is thin reduce it by boiling. Syrup should be of same consistency as in jars of preserved ginger.

APPLE BUTTER

Sweet apples are usually used, though some prefer half sweet and half sour.

Pare, core and slice apples, cover with boiled cider and simmer gently fifteen minutes, stirring often. Place in top of double boiler and cook for several hours. When apples begin to break sweeten to taste. To eat with meats should be rather sour.

GRAPE BUTTER

4 pounds grapes,
4 pounds sugar,
3 cups vinegar,

2 teaspoons each of cloves,
nutmeg, cinnamon, allspice.

Cook all together until thick; press through sieve, fill glasses. Seal.

GRAPE CATSUP

3 quarts of grapes, washed,	2 teaspoons whole allspice,
cooked, and sifted,	2 teaspoons stick cinnamon,
2 pounds of brown sugar,	$\frac{1}{2}$ teaspoon cayenne pepper,
1 pint of vinegar,	1 teaspoon salt.
2 teaspoons whole cloves,	

Tie spices in cloth. Cook all ingredients together until very thick. Pack while hot and seal at once.

PINEAPPLE PRESERVES

Pare pineapple, carefully remove eyes, shred or slice and cut in cubes. Weigh; use half weight of sugar. Stir and heat gradually to boiling. Simmer ten minutes. Place in jars. Seal.

WATERMELON PRESERVES

Cut one pound watermelon rind into inch squares. Allow to stand overnight in clear water. Drain and cover with about 30° syrup (two cups sugar to one quart water). Boil for twenty-five minutes. Let stand overnight immersed in syrup. Next morning add juice of one-half lemon and three slices of lemon additional for each pound. Cook until transparent (about one hour). Let stand until cold. Pack, add the syrup, garnishing with slices of lemon. Place top on jar and cook three minutes.

GINGERED WATERMELON RIND

To each pound of rind cut into one inch squares, add two quarts of water and one ounce slacked lime. Let stand in lime water overnight. Next morning drain and let stand one to two hours in fresh cold water. Drain well and boil rapidly in strong ginger tea (one ounce ginger to one quart water) for fifteen minutes. Drain, put into a 30° syrup made by using one pint strained ginger tea with one quart water and one and one-half pounds of sugar. Cook until tender and transparent (about one and one-half hours). After boiling a half hour add half a lemon sliced thin. Place in shallow pans to cool, having the rind well covered with syrup. When cool arrange pieces attractively in jars, cover to overflowing with syrup. Place top on, clamp, and cook thirty minutes and seal.

WATERMELON SWEET PICKLE I

Prepare seven pounds watermelon rind by removing pink pulp and green rind, and cover with cold water, to which is added one teaspoonful salt to each quart water. Let stand overnight, then rinse and drain thoroughly. Boil together three and one-half pounds sugar, one pint vinegar, two ounces paper-bark cinnamon, and one ounce cloves; add rind and let cook until transparent. Set aside overnight. Let boil a second time, drain rind from syrup, reduce syrup by boiling and pour over rind. Pack in fruit jars.

WATERMELON SWEET PICKLE II

Cut the pink pulp from watermelon rind and also the hard green outer portion. Cut rind into pieces about two inches long and one inch wide. Boil rind in one quart of salt water (one-quarter cupful salt to one quart of water) to the pound of rind, for fifteen minutes. Drain well and soak in cold water until the flavor of salt is gone. Drain carefully and soak in lime water overnight (two ounces of lime to one gallon of water). This step may be omitted but it improves the pickle. Drain next morning and cook rapidly in a syrup made by boiling together one pound of sugar, one pint of water, one pint of vinegar, one teaspoon each of cloves, cinnamon, and allspice, and if desired one-half teaspoon of mace. Cook until rind becomes clear and transparent. Pack in hot sterilized jars and seal.

PEAR MARMALADE

4 pounds pears,	Juice of 2 lemons,
4 pounds sugar,	Lemon rind cut in small
3 ounces of preserved ginger,	pieces.

Cut pears and ginger into small pieces and add other ingredients. Boil with gentle heat until the pears are clear. Pack and seal.

APPLE CHUTNEY

2 sour apples,	1 pint cider vinegar,
1 onion (chopped),	½ cup acid jelly,
1 red pepper seeded and	2 cups brown sugar,
chopped,	Juice of 4 lemons,
2 green peppers seeded and	1 teaspoon ground ginger,
chopped,	¼ teaspoon paprika,
2 cup raisins (chopped),	1 teaspoon salt.

Pare, core and slice the apples, soak with the other in

one cup of cider vinegar for one day. Add chopped onion. Combine with another cup of vinegar and boil until the apples are tender. Pack in small jars, seal and boil in the jars under water for thirty minutes.

CHILI SAUCE

Three quarts ripe tomatoes cut in pieces. Cook tomatoes one hour and add

2 cups chopped onions,	$\frac{1}{2}$ tablespoon whole allspice,
1 cup sugar,	$\frac{1}{2}$ tablespoon whole cinna-
$\frac{1}{2}$ teaspoon paprika,	mon,
and the following spices	1 large green pepper
tied in a cloth:	(chopped),
$\frac{1}{4}$ cup mustard seed,	1 large red pepper (chopped),
$\frac{1}{2}$ tablespoon whole black	2 teaspoons salt.
pepper,	

Boil all together one hour. Add one quart of vinegar and simmer until done, about two hours. Bottle and seal while hot.

TOMATO CATSUP

One gallon tomato pulp, one quart cider vinegar, one pound brown sugar, four ounces salt, one ounce whole pepper corns, one ounce whole spice, one-half ounce whole cloves, one-half ounce ginger, one ounce ground mustard. Add the other ingredients to the tomato pulp, tying the whole spices in cheese cloth; simmer for one and one-half hours, remove spices, bottle and seal.

PICKLED BEETS

Cook baby beets until tender, remove skins, pack into jars and cover with spiced vinegar, made as follows:

$\frac{1}{2}$ gallon of vinegar,	$1\frac{1}{2}$ tablespoons mustard
$\frac{1}{2}$ cup grated horseradish,	seed,
$1\frac{1}{2}$ tablespoons celery seed	1 tablespoon salt,
(crushed),	1 tablespoon cinnamon,
1 cup sugar,	1 teaspoon cloves.

Seal the jars and cook for thirty minutes under water. Beets are better canned in water and made into pickles later.

SWEET PICKLED CARROTS

Boil young tender carrots until three-fourths done, scrape, cut in thin slices, and pour a boiling spiced syrup

over them, made by boiling together one quart of vinegar, one quart of sugar, one tablespoon each of cinnamon and cloves, and one teaspoon each of mace and allspice. Allow carrots to stand over night in this syrup. Next morning boil for five minutes, cool quickly, pack in jars, strain syrup over them, seal and cook under water for thirty minutes. Tighten covers, label and store.— *“Successful Canning and Preserving”* by Ola Powell.

SPICED GREEN TOMATOES

6 pounds small whole green tomatoes,	1 tablespoon cinnamon,
4 pounds sugar,	$\frac{1}{2}$ tablespoon cloves,
1 pint vinegar,	$\frac{1}{2}$ tablespoon allspice,
	$\frac{1}{2}$ tablespoon mace.

Scald and peel tomatoes. Make a syrup of the sugar, vinegar and spices. Drop in the whole fruit and boil until the tomatoes become clear, pour all into trays, Pack into hot sterilized jars, seal, label and store.

SAUER KRAUT

Remove outer leaves from firm cabbage, cut out core and pare it. Put into kraut cutter or cut with knife. After cutting with knife or shredding as fine as possible on clean wooden top table, put in barrel, keg or stone jar immediately as exposure to the air impedes fermentation, and may turn kraut gray or black. Line bottom of barrel with loose clean cabbage leaves or grape leaves, then a layer of cut cabbage about six inches deep. Salt, three-fourths pound of best dairy salt to twenty-five pounds cabbage. Pack down in barrel or keg with heavy wooden mallet to expel air, pack layer after layer until the barrel is filled. The cabbage should then be weighted with hard wood cover which is weighted down with stones to prevent air from coming in contact with kraut. Do not use lime or sandstone for weights. Keep covered with brine, allow the kraut to ferment three or four weeks or until no more gas bubbles rise. Pack and use as desired. Turnips may be combined with cabbage.

BRINING CUCUMBERS

Pack cucumbers in substantial barrel, keg or stone jar as tightly as possible, without bruising. Make brine of soft water and salt in the following proportions: one pound

of the best salt to one gallon of water (use a little more salt if it seems weak). A good measure of salt is absolutely necessary to keep the cucumbers, but the brine draws out the water from the tissues of the vegetable and toughens them somewhat. For this reason the weaker brine will give a better texture to the finished product. The cucumbers must be weighted down so the brine will completely cover them. A cloth may be tied over the top to keep out the dust and to admit air.

CUCUMBER PICKLES

Remove cucumbers from the brine and wash. Cover them with cold water and allow them to soak three hours. Drain, and cover with cold water again and soak three hours. Drain, and cover with a weak solution of vinegar and allow them to stand for two or three days before using. If the pickles seem too salt, the soaking process should be repeated several times, before adding vinegar.

If a slightly spiced pickle is desired, boil together for five minutes:

1 quart vinegar,	1 pound brown sugar,
$\frac{1}{4}$ cup whole peppercorns,	2 tablespoons cloves,
1 pod red pepper,	1 tablespoon mace.

Drain off the first vinegar. Pack cucumbers in jars with clamp tops. Pour this spiced vinegar over the cucumbers. This amount will be sufficient for one gallon of pickles. Boil for thirty minutes under water with the second clamp up. Remove, and seal jar.

CUCUMBER PICKLES (FRESH)

Wash the cucumbers, put in a jar, mix one-fourth cup of salt, three-fourths cup of light brown sugar, and one-fourth cup of dry mustard to which add one quart of vinegar. Stir this well. Pour the mixture over the pickles to cover well. Seal in glass spring-top jars, let the pickles stand a week before using.

DILL PICKLES

Wash and wipe cucumbers, arrange in crock or keg, place bunches of dill, clean grape leaves and small red peppers cut into pieces, use generously in between layer. Cover with brine made of one pound of dairy salt to six quarts of

water, boil and skim, add water if much evaporates. When cool pour over pickles, spread over top more dill, a layer of cabbage leaves and clean cloth, cover and leave for about three weeks, when they will be ready for use, or to be sealed for future use.

PICKLED ONIONS

For small white onions, cover with a brine of one-half cup of salt to two quarts boiling water. Let stand three days, drain and cover with more brine and let stand two days more. Drain again, soak two hours in clear cold water. Put in jars with one or two slices of red peppers. Fill to overflowing with hot vinegar which has been scalded with sugar and mustard seed. (One cup sugar and two table-spoons of mustard seed to the gallon of vinegar.) Seal the jars while hot.

PICKLED BEANS

Use tender beans, break ends and remove strings. Break into desired lengths, boil until tender; about twenty minutes. Add a little salt to beans; fill jars with hot beans. Make a syrup of one cup sugar, two cups vinegar and boil from eight to ten minutes. Pour over beans while hot and close the jars. If sour beans are preferred boil the vinegar without the sugar and pour over beans.

MIXED PICKLES

3 large heads of cabbage,	1 peck green tomatoes,
1 quart vinegar,	1 dozen medium sized onions,
2 pounds sugar,	2 dozen cucumbers,
½ ounce each of cloves, cin-	1 dozen green peppers.
namon, allspice, and mace,	

Chop vegetables separately and very fine. Mix all together and put in an earthenware crock in alternate layers with salt. Let stand over night. Then squeeze dry and cover with cold vinegar. Let it stand twenty-four hours and squeeze as before. Mix vinegar with spices, add sugar, boil for five minutes, and pour over the chopped vegetables. Allow to stand for several hours. Pack in jars, garnish with strips of red pepper, cover with spiced vinegar, and cook thirty minutes with second clamp up. Remove and seal. — *“Successful Canning and Preserving,” by Ola Powell.*

CIDER VINEGAR

Briefly summarized, the method to be employed for the manufacture of good vinegar at home without the use of generators is this:

Use sound, ripe apples, picked or picked up before they become dirty, if possible, otherwise wash. Observe the ordinary precautions to secure cleanliness in grinding and pressing and discard all juice from second pressings. If possible, let the juice stand in some large receptacle for a few days to settle, then draw off the clear portion into well-cleaned barrels which have been treated with steam or boiling water, filling them only two thirds or three-fourths full. Leave the bung out, but put in a loose plug of cotton to decrease evaporation and to prevent the entrance of dirt. If these barrels are stored in ordinary cellars where the temperature does not go below 50° or 45° Fahrenheit, the alcoholic fermentation will be complete in about six months; but by having the storage room at a temperature of 65° or 70° the time can be considerably shortened, and the addition of compressed yeast and its equivalent at the rate of one cake to five gallons of juice may reduce the time to three months or less. Use a little water to thoroughly disintegrate the yeast cake before adding it to the juice. The temperature should not go above 70° for any length of time, to avoid loss of the alcohol by evaporation.

After the sugar has all disappeared from the juice, (that is, when the cider has entirely ceased "working," as revealed by the absence of gas bubbles), draw off the clear portion of the cider, rinse out the barrel, replace the liquid and add two to four quarts of good vinegar containing some "mother," and place at a temperature of 65° to 75° Fahrenheit. The acetic fermentation may be complete in three months or may take eighteen months, according to the conditions under which it is carried on; or if stored in cool cellars may take two years or more. If the alcoholic fermentation be carried on in the cool cellar and the barrel then be taken to a warmer place, as outdoors, during the summer, the time of vinegar formation may be reduced from that given above to fifteen or eighteen months. Where the alcoholic fermentation is hastened by warm temperature storage and use of yeast and the acetic fermentation favored by warmth, and a good vinegar "start" it is possible to produce good merchantable vinegar in casks in six or twelve months.

When the acetic fermentation has gone far enough to produce 4.5 to 5 per cent. of acetic acid, (or has a pronounced vinegar taste) the barrels should be made as full as possible and tightly corked in order to prevent destructive changes and consequent deterioration of the vinegar.

— *New York Experiment Station Bulletin No. 258,*
Geneva, N. Y.

NOTE: Apples or apple peelings make the best vinegar, but peach and other fruit peelings may be used. Vinegar may be made in smaller quantities for home use, when earthenware jars or crocks make excellent containers. Two or three thicknesses of cheesecloth may be tied over the opening of the crock or jar instead of the loose cotton plug as is used in the barrel. On this small scale, the vinegar needs the same care but may be "ripened" in shorter time than in the barrels since it can be kept in a uniformly warm temperature (about ordinary room temperature). If the vinegar becomes too thick with the growth called "mother," strain the juice, reserve a large, firm piece of the mother, put the vinegar back in the container and lay the reserved portion of the mother on top. This growth is not harmful, but is not desirable in such quantities as will cloud the vinegar. It is an indication of the strength and good quality of the vinegar, and also that it is ready for use. It is generally advisable to add a little more sweetened water to the vinegar after the surplus mother has been strained out.

PRESERVING EGGS

During the spring and summer months when the production of eggs is greatest and the price is lowest they should be preserved for winter use when they are scarce and high. There are two methods by which eggs can be successfully preserved: 1. The waterglass method and, 2. The Limewater method.

SUGGESTIONS

1. Eggs must be fresh, preferably not more than two or three days old. It is well to have the preservative ready to receive eggs as they are gathered. If there is any doubt

of their freshness it will be best to candle them or test them in a pan of cold water and see that they sink readily.

2. Spring eggs have better keeping qualities than summer eggs.

3. Use infertile eggs for preserving. After the hatching season exclude roosters from the flock and kill them for table use as needed.

4. Shells should be clean but washing lessens the keeping qualities so should be avoided by all means. Washing removes the protective gelatinous covering, and dirty eggs become tainted in flavor.

5. Eggs must be free from cracks. The smallest crack may spoil a large number of eggs.

6. Earthenware crocks are good containers and they should be absolutely clean and sound. A crock holding six gallons will hold eighteen dozen eggs and about twenty-two pints of solution.

7. Do not use the same liquid preservative more than one year.

8. Do not allow eggs to stay in preservative more than a year.

9. Rinse the eggs with water after removing them from the preservative.

10. Eggs that are in good condition when removed from the water-glass will usually remain good for at least two weeks.

11. In boiling eggs which have been preserved in water-glass, prick a small hole through the large end of the shell before placing them in the water. The water-glass deposits a substance on the shell which seals the pores and without the pin-hole the expanding air would cause the shell to burst.

12. The pink appearance of the white of the eggs which have been stored in water-glass is probably due to iron in the preservative and does not injure the egg for food purposes.

PRESERVING EGGS IN WATER-GLASS

Water-glass is known to the chemist as sodium silicate. It can be purchased by the quart from druggists or poultry supply men. It is a pale yellow syrupy liquid and is used in the proportion of one quart of this liquid to twelve quarts of pure soft or distilled water. The water should be boiled and then allowed to cool. Half fill the crock with this solution and place the eggs in it being careful not to crack them. The

eggs can be added a few at a time until the container is filled. See that those at the top are submerged under at least two inches of the liquid. Cover the crock and place it in the coolest place available and where it can remain undisturbed during the year. Inspect from time to time and replace any water which has evaporated with cold water which has been boiled.

NOTE: Water-glass in the form of powder is now on the market. It can be dissolved in a definite quantity of water as stated on the package, and for this reason is more reliable than the commercial solution, which varies in concentration.

PRESERVING EGGS IN LIMEWATER

Limewater affords another method of preserving eggs which is quite satisfactory and is somewhat cheaper than water-glass. Make a solution of three pounds of unslacked lime and five gallons of water which has been boiled and cooled. Allow this mixture to stand until the lime settles and the liquid is clear. The eggs should be placed in a clean earthenware crock or other suitable vessel and covered to a depth of two inches with the liquid. The liquid may be poured in the crock and the eggs added as they are gathered. Remove the eggs as desired, rinse in cold water and use immediately.

DRYING FRUITS AND VEGETABLES

Drying cannot be over-stressed in these war times. In the summer months if you have extra food such as fruits and vegetables dry them and save them for winter use. There are several reasons for drying fruits and more reasons for drying vegetables: First, it is an economical method of storing food; second, food can be perfectly preserved by drying; third, it reduces the bulk and increases the shipping facilities of foods; fourth, drying can be successfully accomplished by the inexperienced; fifth, beans, peas, corn, okra are difficult to can and if dried properly and soaked before cooking are almost as good dried; sixth, **WE MUST SAVE FOOD FOR THE SOLDIERS** who are fighting our battles in Europe.

METHODS OF DRYING

There are several methods employed in drying and each method has its own merits according to circumstances and climate. Briefly these methods are as follows:

1. The oldest method known, *sun drying*, used very little at the present time in this country as a whole, but used quite extensively in California where the atmosphere is dry during the drying season. Sun drying should be supplemented with a drying in the oven to kill larvae.

2. Kiln drying, extensively used commercially, but not practical for home drying on a small scale.

3. Steam drying both with home and commercial dryers. This method is used on a small scale in the home but is one of the chief methods used for drying foods for commercial use.

4. Oven drying. This method involves the same principle as kiln drying and is used in the home quite extensively and successfully.

5. Top-stove drying. This method is used to some extent in the home, in home drying devices found on the market. One dryer used quite extensively has a galvanized base and shelves on which the food is placed.

6. Fan drying. This method is used both in the home and for commercial purposes as well. Any type of fan is used which moves a sufficient quantity of air. The air should move at not less than one thousand feet per minute and should move much faster if possible. Any blower or separator fan can be used if the food is placed on trays in a screened enclosure. (See note at bottom of page 31).

For home drying the *oven method* is one of the most successful and practical. The middle shelf in the oven is used and the oven racks and some cheesecloth and a steamer are the only equipment absolutely necessary. A thermometer helps one to establish the correct temperature for the particular food being dried but with a little patience and experience and careful attention to tables sufficient skill in judging may soon be attained. The middle shelf of the oven is used since it is the coolest shelf and the temperature is more uniform in this part of the oven. If a gas stove is

used the pilot may afford sufficient heat especially if it runs the full length of the oven. If an oil stove is used the burner must be turned very low. If coal or wood is used the heat must be very carefully watched in order to keep it uniform. Coal and wood dries more quickly than gas. It is generally safer to leave the oven door open, and test with the hand frequently. It should never be hot enough in the oven to scorch the cheesecloth in which the rack is wrapped.

STEPS TAKEN IN DRYING

1. Preparation of fruits or vegetables. This generally means preparing as for cooking, yet may mean more finely divided at times. The time for drying is lessened according to the fineness of division.

2. Steaming or blanching according to the food substance being dried. The steaming or blanching before drying has various advantages: (1) The color is kept better. (2) The drying is accomplished more quickly since the evaporation begins at once. (3) The cooking is accomplished much more quickly when the vegetables are to be eaten.

3. Drying.

4. Testing. The food is dried when it is "leathery" in appearance and is overdried when it becomes brittle.

5. Storing in paper bags or boxes.

NOTE: If interested in a community drying plant costing about \$250, write to the Division of Publications, U. S. Department of Agriculture, and ask for Farmers' Bulletin No. 916, "A Successful Community Drying Plant."

TABLE FOR DRYING FRUITS AND VEGETABLES

Product	Steam	Boil	Time for dryi'g	Temp.	Time for cooking
Apples	3 min.		4-6 hrs.	180°F	5-15 min.
Blackberries			6-9 hrs.	140°F	2-3 min.
Raspberries			4-5 hrs.	140°F	2-3 min.
Apricots	2 min.		4-6 hrs.	140°F	10-15 min.
Cherries			5-6 hrs.	140°F	not cooked
Peaches	2 min.		4-5 hrs.	140°F	10-15 min.
Pears	3 min.		4-6 hrs.	140°F	10-15 min.
Corn		10 min	2 hrs.	140°F	25-30 min.
String Beans	10 min or	10 min	3-6 hrs.	160°F	20-40 min.
Spinach	5 min.		2-6 hrs.	160°F	10-20 min.
Tomatoes		*1 min	5-6 hrs.	140°F	2-4 min.
Carrots	5 min.		3-4 hrs.	140°F	25 min.
Onions	5 min.		2½-3 hrs.	140°F	15-20 min.
Cabbage	10 min		2-3 hrs.	140°F	15-20 min.
Sum'er Squash		5 min.	3-5 hrs.	140°F	20-30 min.
Pumpkin		5 min.	3-5 hrs.	140°F	20-40 min.
Okra	3 min.		2-4 hrs.	140°F	15-20 min.
Garden Peas		5 min.	3-4 hrs.	140°F	20-25 min.

*(To remove skin).

NOTE: This table cannot be adhered to exactly but the approximate time and temperature is helpful and therefore given.

METHOD OF PREPARING FRUITS AND VEGETABLES FOR DRYING

The method of preparation of foods for drying does not differ greatly from the method for immediate use. Fineness of division facilitates more rapid drying. For drying in the oven pin cheesecloth over the grate and distribute the prepared fruit or vegetable evenly over it and place in middle of oven. It may be well to stir them around occasionally.

SOME SPECIAL DIRECTIONS

SOUP MIXTURES

The following combinations are suggested for soup mixtures: Puree of green peas; carrots, onion and celery tops; carrots, peas and onions; tomato and onion; grated carrot can be shredded very attractively; shredded cabbage and turnip; parsley, carrots and onions; celery, cabbage, onion and parsley; apple leather; tomato leather.

DRIED STRING BEANS

Prepare young, tender beans as for canning. Cook in boiling water about ten to fifteen minutes. Spread on an evaporator such as a rack in the oven covered with cheesecloth or an improvised steam dryer, or in the sun and dry until they are leathery in appearance.

DRIED CORN

Boil corn on the cob for ten minutes or until the milk is set. Cut from the cob and dry as beans.

DRIED SQUASH OR PUMPKIN

Pumpkin or squash may be pared, cut in slices, steamed fifteen minutes and dried as beans.

DRIED OKRA

Scald okra for three minutes in boiling water and dry as beans. Okra may be cut in rings ready for soups. Okra should be dried rapidly to prevent darkening.

DRIED FRUITS

Practically all fruits may be dried. Cut fruits in desired size, but bear in mind that the greater the surface of fruit exposed to the air the more rapid the drying. Thin flat pieces are desirable shapes for drying.

STORING DRIED PRODUCTS

Dried foods may be kept in bags where air may come in contact with them during the dry summer months. During this period they should be carefully protected from flies and insects. It was thought last year when drying or de-

hydrating became so popular that glass or tin containers would be ideal for storing them, but experience has proven that paper bags and boxes are far superior. A paper towel as a lining for boxes has proved quite successful since it absorbs the moisture. Flour or sugar bags are sometimes used for the foods and dipped in melted paraffin before storing. At the slightest indication of mold or weevil the dried products should be heated in a slow oven to a temperature as high as is safe for the foods. Great care must be exercised in this process.

POINTS TO BE CONSIDERED IN USING DRIED AND CANNED FRUITS AND VEGETABLES

1. On opening a canned vegetable, pour the canned contents into a vessel in which it is to be cooked and allow the vegetables to come in contact with the fresh air. This will help it regain the original fresh, vegetable taste. If the liquid in which the vegetable has been canned is not desired for cooking purposes drain and pour fresh water on the vegetable.

2. Where possible, save the liquid in which the vegetable has been cooked, as there is food material in it which has been extracted from the vegetable. This liquid can be utilized in making soups, or, if it is tomato juice, a tomato sauce can be made which is delicious when combined with meat.

3. Dried vegetables and fruits must be soaked in three or four times their weight in water. The object in doing this is to replace the moisture which was lost during evaporation. Dried vegetables, if not soaked, are tough and lose their best flavor. When possible, soak the food over night, or an equivalent length of time, and it will become plump, as it was originally, and the hard cellular matter is likewise softened, which operates to make the vegetable more easily digested when cooked and eaten.

REFERENCES OF INTEREST IN CONNECTION WITH THIS BULLETIN

United States Department of Agriculture, Washington, D. C.:

Evaporation of Apples — Farmers' Bulletin No. 291.

Drying Fruits and Vegetables in the Home — Farmers' Bulletin No. 841.

Home Canning of Fruits and Vegetables — Farmers' Bulletin No. 853.

Manufacture and Use of Unfermented Grape Juice — Farmers' Bulletin No. 644.

Muscadine Grape Juice — Farmers' Bulletin No. 758.

Use of Fruit as Food — Farmers' Bulletin No. 293.

Canned Fruits, Preserves, and Jellies — Farmers' Bulletin No. 203.

Home Canning by the One-Period Cold-Pack Method — Farmers' Bulletin No. 839.

Fresh Fruits and Vegetables as Conservers of Other Staple Foods — Farmers' Bulletin No. 871.

Homemade Fruit Butters — Farmers' Bulletin No. 900.

A new book, "Successful Canning and Preserving," by Ola Powell, \$2.00, is a little encyclopedia of canning, and drying and methods of using the canned and dried foods which would be of practical value to any housekeeper.

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